

CLAIMS

What is claimed:

1. A method for rendering an edit of source material including time-based media, wherein the edit represents a plurality of time spans, comprising:
 - constructing a graph of operators corresponding to the edit, wherein each operator in the graph represents an operation employed in the edit, and wherein the graph includes connections among the operators, wherein different connections among the operators are active for different time spans, wherein the graph of operators represents a combination of operations used to render the edit at each point in time; and
 - rendering the edit using the graph of operators by time multiplexing the connections defined among the operators according to the time spans when each connection is active.
2. The method of claim 1, wherein rendering comprises:
 - for each different time span, extracting an expression tree from the graph of operators, wherein each extracted expression tree represents the operators and connections among the operators that are active in the time span; and
 - processing each extracted expression tree in time order to render the edit.
3. The method of claim 2, further comprising:
 - examining each extracted expression tree to determine if each of the operators and connections represented in the extracted expression tree is available for rendering the time span represented by the extracted expression tree.
4. The method of claim 3, further comprising:
 - if one or more of said operators and connections represented in a first expression tree is not available:
 - dividing the first expression tree into two or more sub-expression trees;
 - processing at least one of the two or more sub-expression trees to obtain an intermediate rendering result; and

storing the intermediate rendering result for subsequent incorporation in time order into the rendering of the edit.

5. The method of claim 1, wherein the source material comprises digital video information.
6. The method of claim 1, wherein the source material comprises digital audio information.
7. The method of claim 1, wherein the source material comprises three-dimensional model information.
8. The method of claim 1, wherein the source material comprises three-dimensional animation information.
9. The method of claim 1, wherein each node in an expression tree includes a link to the operator corresponding to the node, wherein the link allows information to be requested from the operator when the expression tree is processed.
10. The method of claim 1, wherein the operator graph is stored in a non volatile memory.
11. A computer program product comprising:
 - a computer readable medium;
 - computer program instructions stored on the computer readable medium that, when processed by a computer, instruct the computer to perform a method for rendering an edit of source material including time-based media, wherein the edit represents a plurality of time spans, comprising:
 - constructing a graph of operators corresponding to the edit, wherein each operator in the graph represents an operation employed in the edit, and wherein the graph includes connections among the operators, wherein different connections among the

operators are active for different time spans, wherein the graph of operators represents a combination of operations used to render the edit at each point in time; and

rendering the edit using the graph of operators by time multiplexing the connections defined among the operators according to the time spans when each connection is active.

12. The computer program product of claim 11, wherein rendering comprises:
for each different time span, extracting an expression tree from the graph of operators, wherein each extracted expression tree represents the operators and connections among the operators that are active in the time span; and
processing each extracted expression tree in time order to render the edit.

13. The computer program product of claim 12, wherein the method further comprises:
examining each extracted expression tree to determine if each of the operators and connections represented in the extracted expression tree is available for rendering the time span represented by the extracted expression tree.

14. The computer program product of claim 13, wherein the method further comprises:
if one or more of said operators and connections represented in a first expression tree is not available:
dividing the first expression tree into two or more sub-expression trees;
processing at least one of the two or more sub-expression trees to obtain an intermediate rendering result; and
storing the intermediate rendering result for subsequent incorporation in time order into the rendering of the edit.

15. The computer program product of claim 11, wherein the source material comprises digital video information.

16. The computer program product of claim 11, wherein the source material comprises digital audio information.
17. The computer program product of claim 11, wherein the source material comprises three-dimensional model information.
18. The computer program product of claim 11, wherein the source material comprises three-dimensional animation information.
19. The computer program product of claim 11, wherein each node in an expression tree includes a link to the operator corresponding to the node, wherein the link allows information to be requested from the operator when the expression tree is processed.
20. The computer program product of claim 11, wherein the operator graph is stored in a non volatile memory.
21. A computer program product comprising:
 - a computer readable medium;
 - computer program instructions stored on the computer readable medium that, when processed by a computer, instruct the computer to perform a method for processing a directed graph of operations defined for a plurality of time spans, comprising:
 - constructing a graph of operators, wherein each operator in the graph represents an operation, and wherein the graph includes connections among the operators, wherein different connections among the operators are active for different time spans, wherein the graph of operators represents a combination of operations to be performed at each point in time in the plurality of time spans; and
 - performing the combination of operations according to a time multiplexing of the connections defined among the operators according to the time spans when each connection is active.